REMARKS/ARGUMENTS

As a preliminary matter, Applicants wish to thank the Examiner for thorough examination of the present application as evidenced in the non-final Office Action dated July 21, 2011. The present Response is responsive thereto. As presented above, claims 1, 6, 12 and 16 have been amended. No new matter has been added. Claims 1, 3-6, 8-12, 14-16, 18-21 remain pending upon entry of the present amendment. Reconsideration and allowance are respectfully requested.

Claim Rejections - 35 USC§112

The Office Action rejected claims 1, 3-6, 8-12, 14-16 and 18-21 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As presented above, claims 1, 6, 12 and 16 have been amended.

Particularly, in claim 1, the term "this edge router" is replaced with "the edge router" to make it clear that the term "the edge router" refers to the previous "each edge router" in line 3. Thus the amended claim 1 is definite. Claims 6, 12 and 16 are amended in a similar way, and thus the amended claims 6, 12 and 16 are definite too. Accordingly, the dependent claims 3-5, 8-11, 14, 15 and 18-21 of the claims 1, 6, 12 and 16 are also definite. Hence the applicants respectfully request withdrawal of the rejection under 35 U.S.C. 112.

Claim Rejections - 35 USC§103

The Office Action rejected claims 1, 3, 5, 16, 18, 20 and 21 under 35 U.S.C. 103(a) as being unpatentable over Li et al (US Publication No. 2006/0182119 A1, hereinafter referenced as "Li") in view of Murphy et al (US 7477657 B1, hereinafter referenced as "Murphy"). The rejection is respectfully traversed based on the above amendments of the claims.

As per claim 1:

Amended claim 1 of the present application recites:

A method for realizing QoS guarantee in a MPLS network, comprising:

pre-creating an individual QoS resource list in each edge router to record a resource state corresponding to a path, wherein the resource states of the paths from ~~this~~ the edge router to all other edge routers in the same domain are recorded in said individual QoS resource list; and

each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and then updating the QoS resource list correspondingly.

The amendment of claim 1 is based on the original specification and drawings of the present application. For example, from page 5, lines 6-16, page 6, lines 8-16 and figure 3 of the original application, it can be seen that an individual QoS resource list is **pre-created** in each edge router before any request from user terminals is received.

With reference to Li, Li discloses a system and method for implementing resource allocation in network communication, in which a QoS edge router (QER) list is formed by edge routers along a data flow path, but only the edge router connected with the destination terminal stores the QER list (see, e.g., abstract, paragraphs [0171]-[0177] and figure 5 of Li), in other words, **not** every edge router includes an individual QER list. Accordingly, claim 1 of the present application includes the following distinguishing technical features from Li:

"pre-creating an individual QoS resource list in each edge router to record a resource state corresponding to a path, wherein the resource states of the paths from the edge router to all other edge routers in the same domain are recorded in said individual QoS resource list; and

each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and then updating the QoS resource list correspondingly."

By these distinguishing technical features, claim 1 of the present invention solves a technical problem of how to efficiently and effectively allocate resources for a QoS guaranteed data flow by pre-creation of an individual QoS resource list in each edge router.

With reference to Murphy, Murphy discloses techniques for aggregating end-to-end QoS signaled packet flows through label switched paths, in which a routing device, such as an edge

router coupling a local network to another network, aggregates packet flow reservation requests, and maps the resource requests to Labeled Switch Paths (LSPs) capable of supporting the requested resources (see, e.g., abstract of Murphy).

The applicants respectfully submit that Murphy fails to disclose or teach the above distinguishing technical features of claim 1. Particularly, Murphy is at least silent on the feature "pre-creating an individual QoS resource list in each edge router to record a resource state corresponding to a path, wherein the resource states of the paths from the edge router to all other edge routers in the same domain are recorded in said individual QoS resource list" in claim 1.

It can be seen from claim 1 of the present invention that an individual QoS resource list is **pre-created** in each edge router before any request from user terminals is received, and the individual QoS resource list stores resource states of the paths from the edge router to **all other edge routers** in the same domain. Thus according to claim 1 of the present invention, if there are N edge routers, E_1, E_2, …, E_i, …, E_N, in a domain of a MPLS network, an individual QoS resource list is pre-created in each of the N edge routers, and in the edge router E_i among them, the resource states of the paths from the edge router E_i to the other N-1 edge routers in the same domain are recorded in the individual QoS resource list of E_i. Therefore, **if any of the edge routers receives a request from a user terminal, the edge router can always find a path to an egress edge router in its QoS resource list** (see, e.g., page 6, lines 8-16 and figure 6 of the present application).

However, Murphy does not teach that each edge router includes a pre-created individual QoS resource list that stores resource states of the paths from the edge router to all other edge routers in the same domain. In particular, Murphy discloses "*For each LSP, path data 61 includes IP addresses for an ingress device and an egress device, such as edge routers 8A and 8B… access control module 52 (of edge router 40) determines whether a suitable LSP exists for servicing the request, i.e., whether an LSP is currently established that has ingress and egress devices for servicing the source and destination devices of the packet flow, and that has available capacity to meet the QoS requirements of the request (68). If not, access control module 52 forwards control information to the intermediate network to establish an LSP capable of servicing the requested packet flow (70). Access control module 52 updates path data 61*

(FIG. 3) to reflect the newly established LSP" (see, e.g., column 7, lines 11-15 and 58-67, and figure 5 of Murphy), which shows that there is a possibility in Murphy that the edge router does not find an LSP to an egress edge router for serving a request, in other words, the edge router in Murphy does not store path data of LSPs to **all other edge routers** in the same domain; and if an LSP required is not established, the edge router establishes the LSP dynamically (also shown in column 6, lines 21-25 of Murphy). Thus the scheme disclosed in Murphy is essentially different from that of claim 1 of the present invention. Murphy does not teach "**pre-creating** an individual QoS resource list in each edge router to record a resource state corresponding to a path, wherein the resource states of the paths from the edge router to **all other edge routers** in the same domain are recorded in said individual QoS resource list" as defined in claim 1 of the present invention. Compared with the scheme disclosed in Murphy, claim 1 of the present invention is more efficient and can better guarantee the QoS of a data flow.

Further, the above distinguishing technical features of claim 1 are not disclosed or taught by other documents cited in the Office Action:

Rabie et al (US Publication No. 2003/0076829 A1, hereinafter referenced as "Rabie") discloses a method of bandwidth management in a multiservice connection-oriented network which uses one or more overbooking factors and one or more overbooking models. The method allows an edge node which has received a connection request to accurately determine the bandwidth available on a given link in the network by ensuring that different overbooking models and different overbooking factors are normalized at the edge node (see, e.g., abstract of Rabie);

Kurose et al (US Publication No. 2003/0084089 A1, hereinafter referenced as "Kurose") discloses that in a data transfer apparatus, a transferring destination information reader reads information of a transferring destination terminal associated with a primary destination terminal based on a communication quality request to the primary destination terminal received from a source terminal. A resource reservation instructor gives instructions for a communication resource reservation for purposes of a communication of the quality to the transferring destination terminal. A resource reserver determines whether or not a communication resource of the transferring destination terminal has been reserved based on the instructions by the resource

reservation instructor, and responds a result of the determination thereof to the resource reservation instructor (see, e.g., abstract of Kurose);

Matsubara et al (US Patent No. 7,215,640 B2, hereinafter referenced as "Matsubara") discloses that for on-demand Quality of Service (QoS) transmission of packets, edge nodes update a TERMINAL-PORT TABLE as terminals log-on and then pass their node ID to each terminal that logged on. The nodes establish Quality of Service (QoS) assured pre-set paths through the WAN with conventional IP routing and accordingly update their NODE-PATH TABLE to provide links between the pre-set paths (see, e.g., abstract of Matsubara). Although several tables are involved in Matsubara, it fails to disclose any table pre-created in each edge router for recording the resource states of the paths from the edge router to all other edge routers in the same domain.

Therefore, none of Rabie, Kurose and Matsubara teaches the above distinguishing technical features of claim 1 from Li.

The distinguishing technical features of claim 1 are not common general knowledge in the art.

In summary, the prior art, as a whole, does not suggest or teach the above distinguishing technical features. The applicants respectfully submit that the prior art does not provide any relative teachings for one of ordinary skill in the art using Li to acquire the above distinguishing technical scheme using the combination of the above distinguishing technical features defined in claim 1 to solve the technical problem to be solved in the present invention. The applicants respectfully submit that it would have been **non-obvious** for one of ordinary skill in the art at the time of the invention to modify Li by the existing technology in the prior art, to solve the problem to be solved in the present invention. Accordingly, claim 1 conforms to the provisions of 35 U.S.C. 103, and thus, is allowable.

As per Claims 3 and 5:

Since independent claim 1 complies with the requirements of non-obviousness, the dependent claims 3 and 5, which depend on claim 1, are also in conformity with the requirements

of non-obviousness, and thus, are allowable.

As per Claim 16:

Amended claim 16 of the present application is an apparatus implementation of the method claimed in claim 1, and comprises all the elements of claim 1.

As stated above, claim 1 complies with the requirements of non-obviousness. For the similar reasons discussed with respect to claim 1 above, claim 16 is also in conformity with the requirements of non-obviousness, and thus, is allowable.

As per Claim 18:

Since independent claim 16 complies with the requirements of non-obviousness, the dependent claim 18, which depends on claim 16, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

As per Claim 20:

Since independent claim 16 complies with the requirements of non-obviousness, the dependent claim 20, which depends on claim 16, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

As per Claim 21:

Claim 21 of the present application defines an MPLS network for realizing QoS guarantee, and the MPLS network comprises the edge router defined in any one of claims 16-20. So, claim 21 at least comprises all the elements of independent claim 16.

As stated above, claim 16 complies with the requirements of non-obviousness. For the similar reasons discussed with respect to claim 16 above, claim 21 is also in conformity with the requirements of non-obviousness, and thus, is allowable.

The Office Action rejected claims 6, 10 and 11 under 35 U.S.C. 103(a) as being unpatentable over Li in view of Rabie and Murphy. The rejection is respectfully traversed based

on the above amendments of the claims.

As per Claim 6:

Amended claim 6 of the present application defines a method for establishing a QoS data path in a MPLS network, comprising: a user terminal sending a QoS resource request to an ingress edge router; said edge router determining information of a path to an egress edge router of the QoS resource request; said ingress edge router determining whether the resource request is accessed or rejected based on comparing available resources of the requested resources corresponding to the path recorded in a QoS resource list with bandwidth resources requested in said resource request; and when the resource request is determined to be accessed, updating said QoS resource list correspondingly; and wherein said QoS resource list is pre-created in each edge router, and the resource states of the paths from the edge router to all other edge routers in the same domain are recorded in said QoS resource list.

It can be seen that claim 6 comprises all the elements of claim 1.

As stated above, claim 1 complies with the requirements of non-obviousness. For the similar reasons discussed with respect to claim 1 above, claim 6 is also in conformity with the requirements of non-obviousness, and thus, is allowable.

As per claim 10:

Since independent claim 6 complies with the requirements of non-obviousness, the dependent claim 10, which depends on claim 6, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

As per claim 11:

Since independent claim 6 complies with the requirements of non-obviousness, the dependent claim 11, which depends on claim 6, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

The Office Action rejected claim 12 under 35 U.S.C. 103(a) as being unpatentable over

Kurose in view of Murphy. The rejection is respectfully traversed based on the above amendments of the claims.

As per claim 12:

Amended claim 12 of the present application defines a method for terminating QoS data transmission in a MPLS network, comprising: an ingress edge router receiving a resource releasing request from a user terminal; said ingress edge router releasing the resources occupied by said user terminal; and then said ingress edge router correspondingly modifying its QoS resource list which records a resource state corresponding to a path; and wherein said QoS resource list is pre-created in each edge router, and the resource states of the paths from the edge router to all other edge routers in the same domain are recorded in said QoS resource list.

It can be seen that claim 12 of the present application comprises all the elements of claim 1.

As stated above, claim 1 complies with the requirements of non-obviousness. For the similar reasons discussed with respect to claim 1 above, claim 12 is also in conformity with the requirements of non-obviousness, and thus, is allowable.

The Office Action rejected claims 14 and 15 under 35 U.S.C. 103(a) as being unpatentable over Kurose and Murphy and further in view of Li. The rejection is respectfully traversed based on the above amendments of the claims.

As per claim 14:

Since independent claim 12 complies with the requirements of non-obviousness, the dependent claim 14, which depends on claim 12, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

As per claim 15:

Since independent claim 12 complies with the requirements of non-obviousness, the dependent claim 15, which depends on claim 12, is also in conformity with the requirements of

non-obviousness, and thus, is allowable.

The Office Action rejected claims 4 and 19 under 35 U.S.C. 103(a) as being unpatentable over Li and Murphy and further in view of Matsubara. The rejection is respectfully traversed based on the above amendments of the claims.

As per claim 4:

Since independent claim 1 complies with the requirements of non-obviousness, the dependent claim 4, which depends on claim 1, is also in conformity with the requirements of non-obviousness, and thus is allowable.

As per claim 19:

Since independent claim 16 complies with the requirements of non-obviousness, the dependent claim 19, which depends on claim 16, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

The Office Action rejected claims 8 and 9 under 35 U.S.C. 103(a) as being unpatentable over Li, Rabie and Murphy and further in view of Matsubara. The rejection is respectfully traversed based on the above amendments of the claims.

As per claim 8:

Since independent claim 6 complies with the requirements of non-obviousness, the dependent claim 8, which depends on claim 6, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

As per claim 9:

Since claim 8 complies with the requirements of non-obviousness, the dependent claim 9, which depends on claim 8, is also in conformity with the requirements of non-obviousness, and thus, is allowable.

CONCLUSION

It is believed that the present patent application, after the above amendments and statement of opinions, has overcome all the defects pointed out by the Examiner, and is in conformity with the relevant provisions. Accordingly, allowance of the claims is respectfully requested.

Respectfully submitted,

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